

CLAIMS:

1. A system for reading and writing information to magnetic media comprising:
an array of write heads arranged in a two-dimensional matrix, wherein each of the write heads defines a write channel for the system; and
an array of magnetoresistive (MR) heads, wherein each of the MR heads defines a read channel for the system.
2. The system of claim 1, wherein the array of MR heads comprises a linear array of MR heads and the array of write heads comprise a planar array of write heads.
3. The system of claim 1, wherein each of the write heads is substantially aligned with a corresponding one of the read heads such that each of the write channels substantially aligns with a corresponding one of the read channels.
4. The system of claim 3, wherein the write channels are separated by less than 100 microns and the read channels are separated by less than 100 microns.
5. The system of claim 4, wherein the write channels are separated by less than 50 microns and the read channels are separated by less than 50 microns.
6. The system of claim 5, wherein the write channels are separated by less than 10 microns and the read channels are separated by less than 10 microns.
7. The system of claim 1, wherein the MR heads comprise giant magnetoresistive (GMR) heads.
8. The system of claim 1, wherein a number of write heads in the array of write heads is the same as a number of MR heads in the array of read heads.

9. The system of claim 1, wherein each of the write heads and each of the MR heads are independently controllable.
10. The system of claim 1, further comprising a write head controller for each of the write heads and an MR head controller for each of the MR heads.
11. The system of claim 1, wherein each write head includes an excitation coil which coils in a direction perpendicular to a plane defined by the planar array.
12. The system of claim 1, wherein at least one of the write heads also functions as an inductive read element that reads pre-written servo marks.
13. A system for reading and writing information to magnetic tape comprising:
 - a first array of write heads arranged in a two-dimensional matrix, wherein each of the write heads in the first array of write heads defines a write channel for the system in a first tape direction;
 - a second array of write heads arranged in another two-dimensional matrix, wherein each of the write heads in the second array of write heads defines a write channel for the system in a second tape direction;
 - an array of magnetoresistive (MR) heads positioned between the first and second arrays of write heads, wherein each of the MR heads of the array of MR heads defines a read channel for the system in both the first and second tape directions.
14. The system of claim 13, wherein the array of MR heads comprises a linear array of MR heads.
15. The system of claim 13, wherein each of the write heads of the first array of write heads is substantially aligned with a corresponding one of the read heads such that each write channel of the planar array of write heads substantially aligns with a corresponding read channel.

16. The system of claim 15, wherein each of the write heads of the second array of write heads is substantially aligned with a corresponding one of the read heads such that each write channel of the second array of write heads substantially aligns with a corresponding read channel.

17. The system of claim 13, wherein the write channels of both the first and second arrays of write heads are separated by less than 100 microns and the read channels of the array of read heads are separated by less than 100 microns.

18. A system for reading and writing information to magnetic tape comprising:
a first array of magnetoresistive (MR) heads, wherein each of the MR heads in the first array of MR heads defines a read channel for the system in a first tape direction;
a second array of MR heads, wherein each of the MR heads in the second array of MR heads defines a read channel for the system in a second tape direction; and
an array of write heads arranged in a two-dimensional matrix and positioned between the first and second arrays of MR heads, wherein each of the write heads defines a write channel for the system in both the first and second tape directions.

19. The system of claim 18, wherein each of the write heads is substantially aligned with a corresponding one of the read heads in the first linear array such that each write channel substantially aligns with a corresponding read channel of the first linear array.

20. The system of claim 18, wherein the write channels of the array of write heads are separated by less than 100 microns and the read channels of both the first and second linear arrays are separated by less than 100 microns.